

Models 102, 102A and 103, 103A

Radio Receivers



Specifications

Frequency Range:

Buff—.54 to 1.6 megacycles
Green—1.6 to 4 megacycles
Red—4 to 10.2 megacycles
Blue—9 to 23.4 megacycles

I.F.:

462.5 K.C.

Tubes:

Type	Position
78	R.F. Amplifier
77	1st Detector
76	Oscillator
78	1st I.F. Amplifier
78	2nd I.F. Amplifier
6B7	2nd Detector; A.V.C.; and 1st A.F. Amplifier
42	2nd A.F. Amplifier
2-53	Output Amplifiers
5Z3	Power Rectifier

Power Supply:

Models 102, 103: 105-125 volts A.C. 60 cycle
Models 102A, 103A: 105-125 volts A.C.
25-60 cycle

A.V.C.:

On type 78, R.F. amplifier and tubes 78, 1st and 2nd I.F. amplifiers.

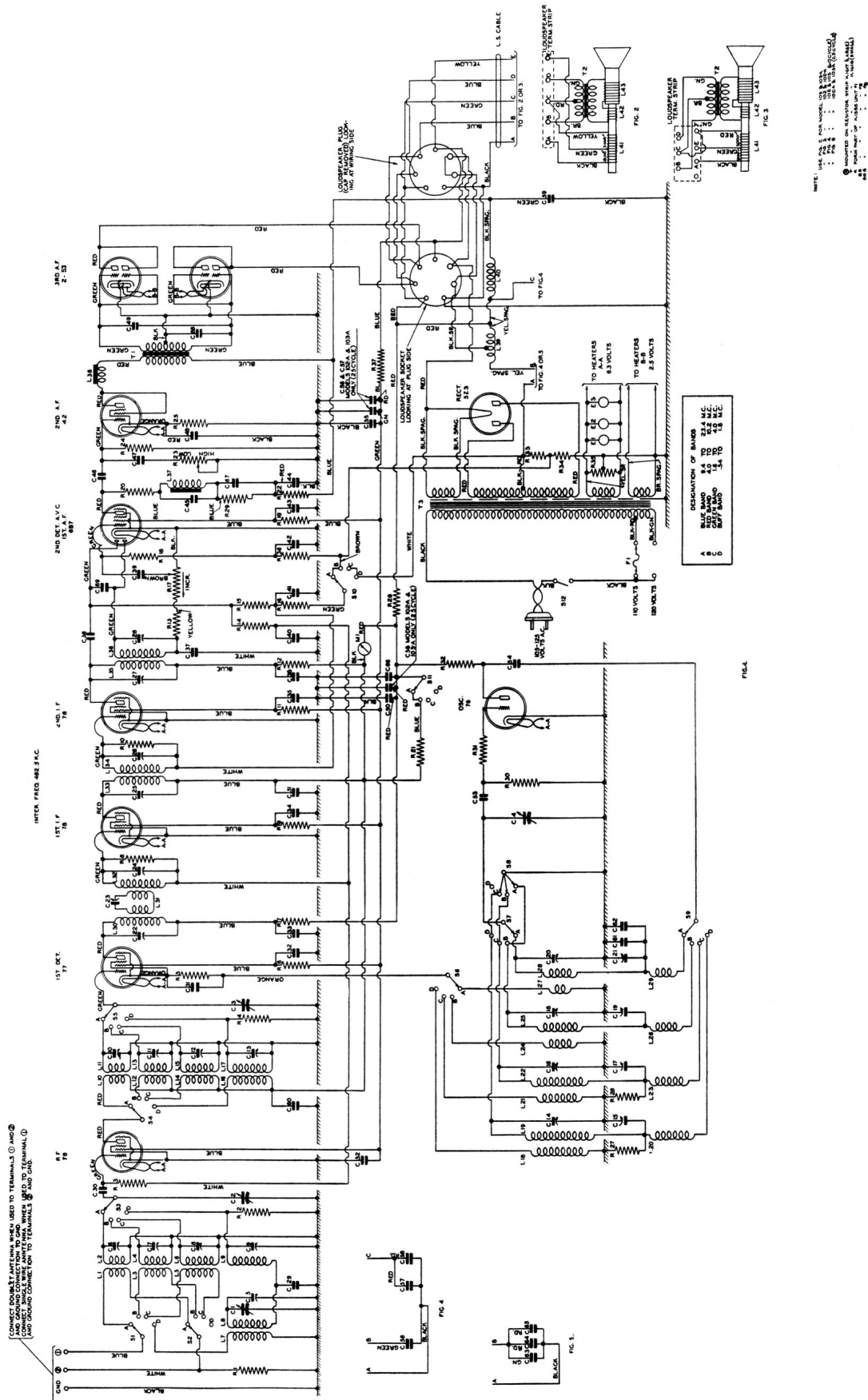
Controls:

Left to Right: Volume control; A.C. switch and tone control; wave change switch; tuning control.

Cabinets:

102, 102A are fitted in bookcase type cabinets. 103, 103A console.

Schematic Diagram—Models 102 and 103 Receivers



REPLACEMENT PARTS LIST

CAPACITORS:—

	Part No.
C-1 Antenna R.F. Preselector standard broadcast tuning.....	K-1577
C-2 R.F. transformer, secondary tuning.....	
C-3 Second R.F. transformer secondary.....	
C-4 Oscillator.....	
C-5 Trimmer for antenna, R.F. preselector.....	
C-6 Trimmer, blue band, 1st R.F. trans. sec., 7-70 mmf.....	K-1028-1
C-7 Trimmer, red band, 1st R.F. trans. sec., 4-25 mmf.....	K-1458-2
C-8 Trimmer, green band, 1st R.F. trans. sec., 4-25 mmf.....	K-1458-2
C-9 Trimmer, standard broadcast band preselector; 4-25 mmf.....	K-1458-2
C-10 Trimmer, blue band, 2nd R.F., trans. sec., 7-70 mmf.....	K-1028-1
C-11 Trimmer, red band, 2nd R.F. trans. sec., 4-25 mmf.....	K-1458-2
C-12 Trimmer, green band, 2nd R.F. trans. sec., 4-25 mmf.....	K-1458-2
C-13 Trimmer, standard broadcast, trans. sec., 4-25 mmf.....	K-1458-2
C-14 Padding, standard broadcast band (3-40 mmf).....	K-1018-10
C-15 Lagging, standard broadcast band (270-600 mmf).....	
C-16 Padding, green band (3-40 mmf).....	K-1018-9
C-17 Lagging, green band (400-800 mmf).....	
C-18 Padding, red band; 4-25 mmf.....	K-1458-2
C-19 Lagging, red band; 500-1000 mmf.....	K-1028-5
C-20 Padding, blue band; 7-70 mmf.....	K-1028-1
C-21 Lagging (variable), blue band; 1000-2000 mmf.....	K-1028-3
C-22 Trimmer, 1st I.F. transformer primary; 35-130 mmf.....	K-1598-1
C-23 Trimmer, 1st I.F. transformer band pass; 35-130 mmf.....	
C-24 Trimmer, 1st I.F. transformer secondary; 35-130 mmf.....	Part of K-1570
C-25 Trimmer, 2nd I.F. transformer primary; 35-130 mmf.....	K-1368-3
C-26 Trimmer, 2nd I.F. transformer secondary; 35-130 mmf.....	Part of K-1571
C-27 Trimmer, 3rd I.F. transformer primary; 35-130 mmf.....	K-1368-4
C-28 Trimmer, 3rd I.F. transformer secondary; 35-130 mmf.....	
C-29 Coupling (double-tuned preselector); .005 mf; 350 volts.....	K-2228-5
C-30 Grid blocking; 100 mmf; mica.....	K-1611-2
C-31 Cathode by-pass; .05 mf; 175 volts.....	K-2227-8
C-32 Screen by-pass; .05 mf; 175 volts.....	K-2227-8
C-33 Plate by-pass; .005 mf; 350 volts.....	K-2228-5
C-34 Screen by-pass; .05 mf; 175 volts.....	K-2227-8
C-35 Screen by-pass; .05 mf; 175 volts.....	K-2227-8
C-36 Plate by-pass; .005 mf; 350 volts.....	K-2228-5
C-37 I.F. by-pass; 50 mmf; mica.....	K-1611-2
C-38 Coupling (A.V.C. diode); 100 mmf; mica.....	K-1611-2

CAPACITORS—continued:—

	Part No.
C-39 Blocking; .05 mf; 175 volts.....	K-2227-8
C-40 A.V.C. by-pass; .05 mf; 175 volts.....	K-2227-8
C-41 A.V.C. by-pass; .05 mf; 175 volts.....	K-2227-8
C-42 A.V.C. by-pass; .05 mf; 175 volts.....	K-2227-8
C-43 Screen by-pass; .25 mf; 175 volts.....	K-2227-10
C-44 Plate by-pass; 4 mf; 450 volts.....	Part of K-1555
C-45 Audio compensating; .003 mf; 175 volts.....	K-2227-2
C-46 D.C. blocking; .05 mf; 350 volts.....	K-2228-8
C-47 Tone control; .05 mf; 175 volts.....	K-2227-8
C-48 Cathode by-pass; 6 mf; 350 volts.....	Part of K-1556
C-49 Audio compensating; .007 mf; 350 volts.....	K-2228-13
C-50 Plate filter; 4 mf; 450 volts.....	Part of K-1555
C-51 Plate by-pass; .1 mf; 350 volts.....	K-2228-9
C-52 Screen by-pass; .05 mf; 175 volts.....	K-2227-8
C-53 Oscillator grid; 100 mmf; mica.....	K-1611-2
C-54 Oscillator plate feed; .02 mf; 350 volts.....	K-2228-7
C-55 Screen filter; 4 mf; 350 volts.....	Part of K-1556
C-56 Power filter; 8 mf; 450 volts.....	Part of K-1555
C-57 Power filter; 4 mf; 350 volts.....	Part of K-1555
C-58 Power filter; 4 mf; 350 volts.....	Part of K-1555
C-59 Power filter; 8 mf; 350 volts.....	Part of K-1555
C-60 Preselector coupling (broadcast) band; .02 mf; 350 volts.....	K-2228-7
C-61 Extra lagging (fixed) blue band; 1000 mmf; mica.....	K-1611-23
C-62 Extra lagging (fixed) blue band; 1000 mmf; mica.....	K-1611-23
C-63 Power filter (25 cycles); 8 mf; 450 volts.....	Part of K-1555
C-64 Power filter (25 cycles); 4 mf; 450 volts.....	Part of K-1555
C-65 Power filter (25 cycles); 4 mf; 450 volts.....	Part of K-1555
C-66 Extra plate filter; .1 mf; 350 volts.....	K-2228-9
C-67 Extra plate filter; .05 f; 175 volts.....	K-2227-8
C-68 Audio filter; .002 mf; 350 volts.....	K-2228-2
C-69 Blocking (diode paralleling); 100 mmf; mica.....	K-1611-2

RESISTORS:—

R-1 Antenna leak; 100,000 ohms; 1/2 watt.....	K-2226-5
R-2 Preselector load; 1/2 meg; 1/2 watt.....	K-2226-3
R-3 A.V.C. filter; 1/2 meg; 1/2 watt.....	K-2226-3
R-4 Preselector load; 1/4 meg; 1/2 watt.....	K-2226-4
R-5 Cathode bias; 5,000 ohms; 1/2 watt.....	K-2226-12
R-6 Screen filter; 5,000 ohms; 1/2 watt.....	K-2226-12
R-7 Plate filter; 1,000 ohms; 1/2 watt.....	K-2226-16
R-8 I.F. load; 1/4 meg; 1/2 watt.....	K-2226-4
R-9 Screen filter; 5,000 ohms; 1/2 watt.....	K-2226-12
R-10 I.F. load; 1/4 meg; 1/2 watt.....	K-2226-4
R-11 Screen filter; 5000 ohms; 1/2 watt.....	K-2226-12
R-12 Plate filter; 1000 ohms; 1/2 watt.....	K-2226-16
R-13 I.F. filter; 50,000 ohms; 1/2 watt.....	K-2226-6
R-14 A.V.C. filter; 1 meg; 1/2 watt.....	K-2226-2
R-15 A.V.C. load; 1 meg; 1/2 watt.....	K-2226-2
R-16 A.V.C. load; 1/4 meg; 1/2 watt.....	K-2226-4
R-17 Volume control; 1/2 meg; variable.....	K-1092-8
R-18 Audio grid leak; 1 meg; 1/2 watt.....	K-2226-2

REPLACEMENT PARTS LIST—continued

RESISTORS—continued:—

	Part No.
R-19 Screen filter; $\frac{1}{4}$ meg; $\frac{1}{2}$ watt	K-2226-4
R-20 Plate coupling; 20,000 ohms; $\frac{1}{2}$ watt	K-2226-8
R-21 Tuning meter shunt (blue and red band); 3,500 ohms; $\frac{1}{2}$ watt	K-2226-69
R-22 Plate filter; 20,000 ohms; $\frac{1}{2}$ watt . .	K-2226-8
R-23 Tone control; $\frac{1}{4}$ meg; variable	K-1142-6
R-24 Audio grid; $\frac{1}{4}$ meg; $\frac{1}{2}$ watt	K-2226-4
R-25 Cathode bias; 2,500 ohms; 1 watt . . .	K-2363-22
R-26 Plate; 2,500 ohms; 1 watt	K-2363-23
R-27 Broadcast oscillator; 2,000 ohms; $\frac{1}{2}$ watt	K-2226-14
R-28 Green band oscillator; 5,000 ohms; $\frac{1}{2}$ watt	K-2226-12
R-29 Plate filter; 40,000 ohms; $\frac{1}{2}$ watt . .	K-2226-34
R-30 Oscillator grid; 20,000 ohms; $\frac{1}{2}$ watt	K-2226-8
R-31 Suppressor; 300 ohms; $\frac{1}{2}$ watt	K-2226-20
R-32 Oscillator plate; 20,000 ohms; 5 watts	K-1461-4
R-33 A.V.C. delay; 20 ohms; 1 watt	K-2363-49
R-34 A.V.C. delay; 35 ohms; 1 watt	K-2363-39
R-35 Centre tap (6.3 volts fil.); 50 ohms	K-1025-2
R-36 Plate filter (hum); $\frac{1}{4}$ meg; $\frac{1}{2}$ watt	K-2226-4
R-37 Screen resistor; 5,000 ohms; $\frac{1}{2}$ watt	K-2226-12

COILS:—

L-1 1st R.F. primary; blue band	#107488
L-2 1st R.F. secondary; blue band	
L-3 1st R.F. primary; red band	#107487
L-4 1st R.F. secondary; red band	
L-5 1st R.F. primary; green band	#107486
L-6 1st R.F. secondary; green band	
L-7 1st R.F. primary; standard broadcast	#107485
L-8 1st R.F. secondary; standard broadcast	
L-9 Preselector; standard broadcast	#107489
L-10 2nd R.F. primary; blue band	
L-11 2nd R.F. secondary; blue band	#107493
L-12 2nd R.F. primary; red band	
L-13 2nd R.F. secondary; red band	#107492
L-14 2nd R.F. primary; green band	
L-15 2nd R.F. secondary; green band	#107491
L-16 2nd R.F. primary; standard broadcast	
L-17 2nd R.F. secondary; standard broadcast	#107490
L-18 Oscillator pick-up; standard broadcast	
L-19 Oscillator grid; standard broadcast	#107514
L-20 Oscillator plate; standard broadcast	

COILS—continued:—

	Part No.
L-21 Oscillator pick-up; green band	#107515
L-22 Oscillator grid; green band	
L-23 Oscillator plate; green band	
L-24 Oscillator pick-up; red band	#107483
L-25 Oscillator grid; red band	
L-26 Oscillator plate; red band	
L-27 Oscillator pick-up; blue band	#107484
L-28 Oscillator grid; blue band	
L-29 Oscillator plate; blue band	
L-30 First I.F. transformer primary	K-1570
L-31 First I.F. transformer link circuit . . .	
L-32 First I.F. transformer secondary	K-1571
L-33 Second I.F. transformer primary	
L-34 Second I.F. transformer secondary . . .	K-1572
L-35 Third I.F. transformer primary	
L-36 Third I.F. transformer secondary	K-1582-1
L-37 Tone compensating choke (300 mh)	
L-38 Tone compensating choke (600 mh)	K-1582-2
L-39 Power filter choke	K-1087
L-40 Power filter choke	K-1087
L-41 Loudspeaker field	Model 102 and Model 102A only
L-42 Loudspeaker hum-bucking	
L-43 Loudspeaker voice coil	Model 103 and Model 103A only
L-41 Loudspeaker field	
L-42 Loudspeaker hum-bucking	K-1607-1
L-43 Loudspeaker voice coil	
L-41 Loudspeaker field	K-1604-1
L-42 Loudspeaker hum-bucking	
L-43 Loudspeaker voice coil	K-1626-1
L-41 Loudspeaker field	K-1625-1
L-42 Loudspeaker hum-bucking	
L-43 Loudspeaker voice coil	

MISCELLANEOUS:—

M-1 Tuning meter (Wave Beam—Model 102-102A only)	K-1426-1
M-1 Tuning meter (Shadowgraph—Model 103-103A only)	K-1606
T-1 A.F. input transformer	#107564
T-2 A.F. output transformer—Model 102-102A	K-1608-1
T-2 A.F. output transformer—Model 103-103A	K-1627-1
T-3 Power transformer—Models 102-103 (60 cycles)	K-1587-1
T-3 Power transformer—Models 102A-103A (25 cycles)	K-1587-2
S-1 } Wave Change Switch	K-1576
S-11 }	
S-12 A.C. power "on-off" switch (mounted on R-23)	K-1142-6

REALIGNING DETAILS

REALIGNING DETAILS:—In realigning the Models 102 or 103 receivers a thoroughly reliable signal generator and an output meter must be used. Great care must be exercised in varying the sliding sections of coils L-6, L-15, L-4 and L-13. Proceed as follows:—

1. I.F.:—

- (a) Set signal generator to 462.5 K.C. and connect to 2nd I.F. control grid lead through .1 mf. capacitor.
- (b) Remove type 76 oscillator tube. Turn volume control to maximum and tone control to treble. Connect ground to set.
- (c) Align C-27 and C-28.
- (d) Connect signal generator to 1st I.F. control grid through .1 mf. capacitor.
- (e) Align C-25 and C-26.
- (f) Connect signal generator to control grid 1st detector tube through .1 mf. capacitor.
- (g) Align C-22, C-23 and C-24.
- (h) Do not realign any trimmer once set.

2. BUFF BAND:—

- (a) Replace oscillator tube. Set wave change switch to buff band and dial to 1400 K.C.
- (b) Set signal generator to 1400 K.C. and connect to number one antenna terminal through 200 mmf. capacitor.
- (c) Align C-14.
- (d) Set signal generator to 600 K.C. and receiver to 600 K.C.
- (e) Align broadcast lag capacitor C-15.
- (f) Set signal generator and receiver to 1400 K.C.
- (g) Realign C-14 if necessary.
- (h) Align C-5 (on gang) C-9 and C-13.
- (i) Set signal generator and receiver to 600 K.C.
- (j) Align C-15, turning dial pointer short distance either side of 600 K.C. position.
- (k) Set signal generator and receiver to 1400 K.C.
- (l) Realign C-14, C-5, C-9 and C-13.

3. GREEN BAND:—

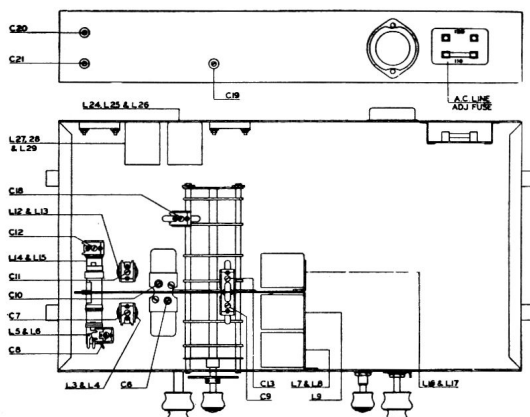
- (a) Turn wave change switch to green band. Set signal generator and receiver to 1.7 meg. Connect signal generator to No. 1 terminal on receiver through .1 mf. capacitor.
- (b) Align C-17.
- (c) Adjust sliding sections preselector coils L-6 and L-15.
- (d) Set signal generator and receiver to 3.4 meg.
- (e) Align C-16, C-8 and C-12.
- (f) Set signal generator and receiver to 1.7 meg.
- (g) Realign C-17 and readjust sliding sections coils L-6 and L-15 if necessary.
- (h) Cement coils into place.

4. RED BAND:—

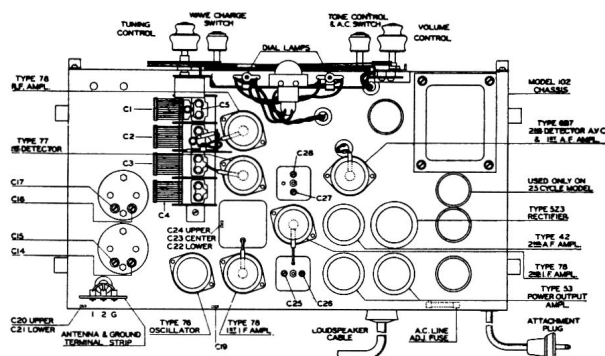
- (a) Turn wave change switch to red band. Set signal generator and receiver to 4.5 meg. Connect signal generator to No. 1 terminal on receiver through .1 mf. capacitor.
- (b) Align C-19.
- (c) Adjust sliding sections coils L-14 and L-13.
- (d) Set signal generator and receiver to 9.0 meg.
- (e) Align C-18, C-7- and C-11.
- (f) Set signal generator and receiver to 4.5 meg.
- (g) Realign C-19 and readjust sliding sections of L-4 and L-13.
- (h) Cement coils into place.

5. BLUE BAND:—

- (a) Turn wave change switch to blue band. Set signal generator and receiver to 11.0 meg. Connect signal generator to No. 1 terminal on receiver through .1 mf. capacitor.
- (b) Align C-21.
- (c) Set signal generator and receiver to 16.0 meg.
- (d) Align C-20, C-6 and C-10.
- (e) Set signal generator and receiver to 11.0 meg.
- (f) Align C-21, turning dial pointer short distance either side of 11.0 meg. position.



Aligning positions under side of chassis.



Chassis layout showing tube and aligning positions

SOCKET VOLTAGE AND CURRENT READINGS

The following readings were taken on a standard production Model 102 chassis, using a Weston type 566 Analyzer modified for use with the type 666-1A adapter.

Tube	Position	Heater Volts	Plate Volts	Screen Volts	Cathode Volts (to heater)	Plate Current	
						Normal Bias	Red. bias (4.5 volts)
76	Oscillator	6.6	115	..	0 (c)	11.5	12.5
78	R.F.	6.6	295	110	0 (c)	2.5	5.5
77	1st Detector	6.6	295	105	5.3	1.1	1.8
78	1st I.F.	6.6	295	105	0 (c)	(a)	(a)
78	2nd I.F.	6.6	295	105	.8 Control Grid (b)	.7 (a)	.75 (a)
6B7	2nd Det.; A.V.C.; 1st A.F.	6.6	245	30	.2 Control Grid (b)	.75	1.5
42	2nd A.F.	6.6	290	290	—30	11.0	12.5
53	1st Output	2.65	(1) 340 (2) 340	..	0 (c)	(1) 22.0 (2) 22.0	(1) 32.0 (2) 32.0
53	2nd Output	2.65	(1) 340 (2) 340	..	0 (c)	(1) 21.0 (2) 20.0	(1) 34.0 (2) 32.0
5Z3	Power Rectifier	5.3	D.C. volts 380 (fil. to plate) A.C. volts 550 (fil. to one plate)			No. 1 plate 96 mils. No. 2 plate 96 mils.	

Line voltage 120 volts A.C.

(a) Oscillation due analyzer cable.

(b) Control grid voltage taken when no cathode voltage readable.

(c) No cathode or C.G. voltage indicated.